An Essay

on the

Nervous System & its Functions.

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The Nervous System & its Functions.

The Nervous System is composed of the cerebro-spinal axis and the Sympathetic nerve. The former consists of the brain or fountain of corporeal motion, sensation etc., and its prolongation, the Medulla Oblongata and Spinal Cord, with their nerves; the latter of numerous ganglia, connected with each other by intervening or commissural fibres, and with the cerebro-spinal axis by nerves running to and from the latter. The brain is divided into two portions, the Cerebrum and cerebellum; these are again divided longitudinally by processes of the dura mater, called according to their location, "falx cerebri" and "falx cerebelli". This same dura mater also separates the cerebrum from the cerebellum by a process called the "tentorium". The whole brain, medulla oblongata and Spinalis are immediately invested by a very vascular membrane, the "pia mater". This dips down between the convolutions, of which the exterior of both portions of the brain are composed, and supplies the material for the nourishment of the entire brain. The minute arteries, of which it is chiefly composed, ramify and diminish in ~~in~~ calibre until the ordinary blood-corpuscle is no longer able to circulate through them. At this point the more subtle or white portion is separated from the mass of crude blood, carrying with it

the finest and most life-like part. These minute vessels approach & the Cineritious substance or glands of the brain, and in so doing carry the material out of which the nervous fluid is made. As the gray nerve cells are found on the entire surface, as well as, in some interior parts, it is evident that the pia matter is coextensive with the cineritious substance. That portion of the pia mater which envelopes the Spinal Cord and medulla oblongata is less vascular and more interwoven with fibrous tissue than that just described. It dips down into the fissures of the Cord & medulla oblongata. The next membrane is the Arachnoid, which is serous in character, and consists of two portions— one being attached very firmly to the dural mater and the other or reflected portion very loosely to the pia mater, by means of fibrous bands. It thus forms a sack, which is filled with a serous fluid, providing a soft and yielding cushion for the moving brain to press against. Between the pia mater and arachnoid, another sack is formed, by the loose attachment of the latter to the former, called the sub-arachnoid space, which is also filled with a lubricating fluid. It covers the pia mater in its whole extent, except where it dips down between the convolutions &c. and into the fissures of the medulla oblongata & Cord.

Interposed between this membrane and the bony cavity is the dura mater, a

very dense, inextendible fibrous membrane. This, in the cranium, consists of two layers;— one acting as periosteum and the other strongly enclosing the brain. Folds of this membrane, as stated before, separate the hemispheres of the cerebrum and cerebellum; also the cerebrum itself from the cerebellum. It inclosethes the spinal Cord and the beginnings of the nerves, arising from it, and the brain. On the vertebral column it consists of one layer only, the inner — the periosteum being continuous with other portion of the vertebrae. Besides this strong protective, bony walls surround the brain and its prolongation, the Cord. The cinerititious substance is situated, for the most part on the exterior of the brain, and is folded or convoluted, whereas, in the medulla oblongata and Cord it is in the interior, and a transversed section shows a double-crescent the horns pointing outwards. Besides the gray matter which constitutes the Convolutions, ganglia are found in the interior of the encephalon, connected with the former by means of nerve fibres. These nerve fibres constitute the white or medullary portion of the brain &c. The convolutions of the cerebrum are large and irregular, while those of the cerebellum are more symmetrical and not deep although thinner. The hemispheres of the cerebrum are connected by a broad Commissure, the "Corpus callosum";— those of the cerebellum by the "vermiform process and by the "pons". The connecting medium of the cerebrum & cerebellum with

the cord, is the medulla oblongata. Fibres from the anterior pyramids and restiform bodies pass to both portions of the brain; or more correctly speaking, conducting fibres from the cerebrum and cerebellum converge and form the medulla oblongata. It is divided longitudinally by grooves or depressions into anterior pyramids, and olivary and restiform bodies. The ganglia which preside over respiration and deglutition, and sensation and voluntary motion are imbedded in it.

The Spinal Cord is divided by the anterior and posterior median fissures into two symmetrical halves or columns, connected by a Commissure of gray and white substance. These columns are subdivided by longitudinal depressions, marking the anterior horns of the gray substance into antero- and postero lateral columns. It is about fifteen inches long and ends in vertically diverging nerves, called from their aggregate shape "Cauda equina." In the centre of the cord as remarked before, is the gray substance, running from one extremity to the other. This is the centre of Spinal reflex action, and the sustainer of its fibres, providing the conducting fluid for them.

The brain, besides distributing nerves through the spinal cord, sends some off directly from ganglia of its own, to the head, lungs, stomach and organs of deglutition. Of these there are twelve and among them are those that supply the organs of special sensibility, all three being found in the head.

The Spinal Cord gives origin to thirty-one pairs which are distributed to the remaining parts of the body.

The Sympathetic System is ganglionic, and seems to originate its own power.

Ganglia are found in the head, neck, thorax, abdomen and pelvis, which are intimately connected with each other, and with its lord, the brain. The aggregation of the small ganglia form larger ones, as the Semilunar Ganglion. The fibres radiating from a ganglion and inoculating with each other, form a plexus, a good example of which is the "solar plexus," situated in the vicinity of the stomach, over the Coeliac axis. Numerous plexuses exist in the whole length of the trunk. The fibres of this system are more grayish than those of the cerebro-spinal system, as well as smaller. The ganglia consist of nerve cells, connected with their fibres, and a stroma of connective tissue.

Having this superficial view, it will be interesting to cast a glance at the minute structure of the brain etc. The cineritious substance, wherever found, consists of nerve-cells or bulbs, communicating with fibres, which constitute the white portion of the Nervous System. These cells are infinitely small and delicate, and yet their diameter exceeds that of the fibres. To the unaided eye both are invisible, but magnifying power brings not only these, but also the terminals of the pia mater to view. Fibres originating

in the cineritious substance, run to the various parts of the body, transmitting the power peculiar to those parts. This is the essential constitution of the Nervous System, and corresponds in many respects with the Circulatory apparatus.

Inasmuch as the gray cells elaborate from the blood those elements which are necessary for the support of animal life, and the manifestation of rational, intellectual action, they may be called glands; while the white portions constitute their ducts, leading to the parts to be animated and acted upon or used. The product of this cell action is the nervous fluid, which varies, of course, with the function it is designed to sustain. Thus for instance, a nerve starting from a gray or glandular centre, and terminating in the kidneys, whose function differs from that of any other organ in the body, it carries a fluid, impressed with properties differing widely from those of any other nervous fluids. As is the quality of this fluid, such is the condition and health — health in its broadest sense — of the body. This is as it were the fountain of animal life — the soul of the body, and the body of the soul. If the fountain be poisonous, it necessarily poisons everything beneath it — it will scatter discord and disease through the body, unless and unless something be applied or inhibited to change the fountain — the animating, material principle, the health of the body will be so deranged as to banish life from it. For it is evident, as the blood is the source whence the

nerve cells abstract their fluid — and as this fluid is poured into the blood, and vitalizes it, that a circle is formed. This circle may be healthy or otherwise; if it be the vehicle of some venom, a venomous circulation is established, which can only be broken by well-adapted tools — appropriate remedies. This is the case, provided the influx of real, immortal life be of so orderly, well-adapted a nature as to assist in purifying the streams of animal life. Should this influx be perverted, it will inevitably do mischief, if it continue, to the delicate, imperceptible organisms of the body, until the latter has accommodated itself to the perversion. A person accustomed to sweet, pure air, going into a foul dungeon, is almost stifled at first, and if he remain there long enough to impregnate the system, may be taken down by violent, fatal disease; on the other hand, as has been proved by prisoners, if a person be introduced into a dungeon, where ventilation is very imperfect, his system gradually accustoms or accommodates itself to the accumulating poison, so that the foul, filling atmosphere becomes his normal element, and his removal is attended with dangerous effects to his health, if not his life. It is no doubt on this principle that the deterioration of health, physical and spiritual has been brought about, and has become so obstinate that it requires the most strenuous labors of physicians, divines, reformers,

as well as those of the public, to rectify it. By a gradual decline of man's spiritual nature, this natural was changed to accommodate itself to its master. Originally, man lived in a state of innocence; there was peace between him and his Maker, because he recognized the beauty and harmony of God's works, and instinctively — undoubtingly lived in conformity to His laws. So long, therefore, as this continued, there can have been no disease; — with God there is no disease — no clashing of laws: by strictly and harmoniously living His laws we in a measure imitate Him, and consequently suffer not from unheeded or abused and unalterable principles. It was man's exit from the "Garden of Eden" — man's beginning to exercise the freedom, which in His wisdom God gave him — by his leaving, as to say His Father's hearth and home, and launching out on his own responsibility, looking at, ~~to~~ investigating things with "self-derived intelligence", which is blindness and stupidity; that alienated him from the beautiful innocence, the unmarred power of reading God in everything, and enjoying health of body and soul. Man, at first was innocent, but not wise; experience, sufferings, trials, temptations and final victory through the accumulated wisdom of ages, make him truly wise, innocent and healthy. If we always knew what to do, and had the inclination to do it, we could avert

inestimable reverses and sufferings; that as we are placed in the midst of things hard to comprehend, yet with the power, the means of comprehending and appropriating for our growth, daily experience, there is hope of finally surmounting all embarrassments on our way to immortality. This must be done by the restoration of order between the inflow of life and the footstool of that life in the body, and by the judicious improvement of that inflow by the exercise of mind — by the cultivation of the brain. It is evident from this, that the normal function of the nervous system is to sustain, under the guiding hand of the soul, the human economy — to carry life to every cell, and impress it with the power to perform its peculiar function; so to harmonize the different parts when aggregated, that there will be no collisions during their functional revolutions; and to be the medium which the immortal mind uses in accomplishing the various activities of life. As the medium of the mind, we find that the generating cerebral centres, or the brain, increase with the intelligence and force of that mind; and going thence from the finite to the Infinite, we find that the divine Brain — the divine Cerebrum and Cerebellum — the divine Wisdom and Love are coextensive with the universe. As God, by this Love and Wisdom sustains the macrocosm; so man, by his love and wisdom — or cerebrum and cerebellum sustains the microcosm, the only difference being, that the one is Infinite and the other finite.